

Product Description Document

Graphical Forecasts for Aviation

Expansion over Hawaii and the Pacific Ocean

Updated: September 12, 2019

Part 1 – Mission Connection

- 1. Product Description:** The operational Graphical Forecasts for Aviation (GFA) are a set of web-based displays that provide observations and forecasts of weather phenomena critical for aviation safety. This product covers the continental United States (CONUS) and United States controlled airspace and Flight Information Regions (FIRs) for which the Aviation Weather Center (AWC) has current area forecast responsibilities in the Gulf of Mexico, Caribbean, and portions of the Atlantic Ocean from the surface up to Flight Level 480 (FL480) or approximately 48,000 ft. above Mean Sea Level (MSL). The experimental region covers Hawaii and portions of the Pacific Ocean from Midway to coastal waters of Central and parts of South America (see Fig. 1).

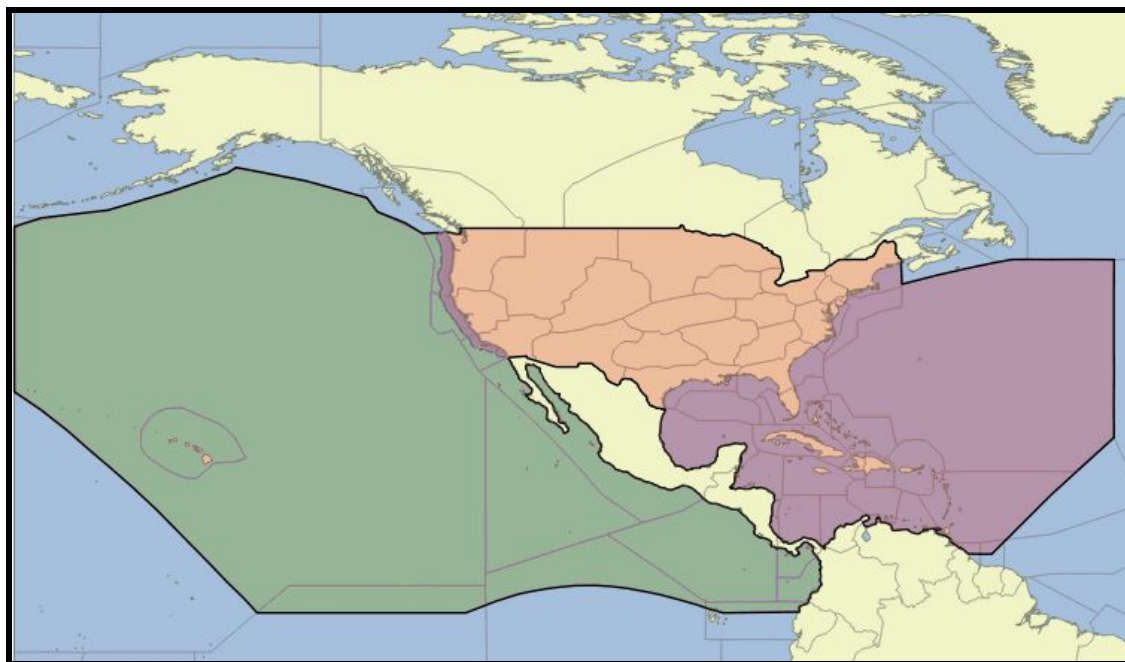


Fig. 1. Domain of the current operational GFA depicting CONUS (orange) and areas of the Gulf of Mexico, Caribbean, and portions of the Atlantic (purple). The experimental region covers Hawaii and portions of the Pacific Ocean from Midway to the Aleutians to the coastal waters of Central and northern South America (green fill).

Wind, icing, and turbulence forecasts are available in 3,000 ft. increments from the surface up to FL180 (18,000 ft. MSL), and in 6,000 ft. increments from FL180 to FL480. Turbulence forecasts

are also broken into LO (below FL180) and HI (FL180 and above) graphics. A maximum icing graphic and maximum wind velocity graphic (regardless of altitude) are also available.

Multiple fields of interest are combined in categories that the user can select from the top of the display. Data are time synchronized and available hourly from the previous 14 hours to present (now) in the *Observations/Warnings* category, and from 1 to 15 hours into the future (+1 to +15 hours) in the *Forecasts* category. The data for each category is determined by the time period: Observations & Warnings (current time and the previous 14 hours) and Forecasts (valid up to 15 hours in the future). Details of each category are in the following table:

| Category | Layer | Data Displayed |
|-------------------------|-----------------------|---|
| Observations & Warnings | METARs | Station Model METARs; SIGMETs; all NWS Warnings impacting aviation; Satellite/Radar (-14 hours to Now) |
| Observations & Warnings | Precipitation/Weather | Weather Symbols; Convective SIGMETs; tropical cyclone, tornado, severe thunderstorm, winter storm, freezing rain, ice, and lake effect snow warnings; Satellite/Radar (-14 hours to Now) |
| Observations & Warnings | Ceiling/Visibility | Flight Category symbol/number; Convective SIGMETs; tropical cyclone warnings; blowing dust, blowing sand and volcanic ash SIGMETs; winter storm, blizzard, blowing dust warnings; dense fog/freezing fog/marine dense fog advisories; Satellite/Radar (-14 hours to Now with selector for FLT CAT, CIG, VIS) |
| Observations & Warnings | PIREPs | PIREPs; all SIGMETs; Satellite/Radar (-14 hours to Now with vertical slider) |
| Observations & Warnings | Radar/Satellite | Radar/Satellite; all SIGMETs; all NWS warnings impacting aviation (-14 hours to Now) |

| | | |
|-----------|-----------------------|--|
| Forecasts | TAFs | Station Model TAFs; all SIGMETs; all NWS warnings impacting aviation (+1 to +15 hours) |
| Forecasts | Ceiling/Visibility | Model derived Flight Category; ceiling & visibility with weather overlay including NDFD precipitation/weather type/intensity; IFR AIRMETs; Convective SIGMETs; tropical cyclone warnings; blowing dust, blowing sand, and volcanic ash SIGMETs; winter storm, blizzard, and blowing dust warnings; dense fog/freezing fog/marine dense fog advisories (+1 to +15 hours with selector for FLT CAT, CIG, VIS) |
| Forecasts | Clouds | Model derived Clouds Coverage, Bases, and Tops; mountain obscuration AIRMETs; Convective SIGMETs; tropical cyclone warnings; volcanic ash SIGMETs (+1 to +15 hours with selector for TOPS/COV/BASE) |
| Forecasts | Precipitation/Weather | NDFD or model derived Precipitation Type/Chance/Intensity; NDFD or model derived Weather; Convective SIGMETs; tropical cyclone warnings; volcanic ash SIGMETs; tornado, severe thunderstorm, winter storm, ice, freezing rain, and lake effect snow warnings (+1 to +15 hours) |
| Forecasts | Thunderstorms | NDFD or model derived Thunderstorms Coverage/Type/Intensity; Convective SIGMETs; tropical cyclone warnings; tornado and severe thunderstorm warnings (+1 to +15 hours) |
| Forecasts | Winds | NDFD or model derived Wind Speed and Gust; low level wind shear and strong surface wind AIRMETs; Convective SIGMETs; tropical |

| | | |
|-----------|------------|---|
| | | cyclone warnings; gale, high wind, lake wind, winter storm, blizzard, ice, storm, and blowing dust warnings (+1 to +15 hours; vertical slider) |
| Forecasts | Turbulence | Graphical Turbulence Guidance; turbulence AIRMETs; turbulence SIGMETs (+1 to +15 hours with vertical slider) |
| Forecasts | Ice | FIP; NDFD or model derived Winter Precipitation/Weather Type/Chance/Intensity; Icing AIRMETs; Icing SIGMETs; winter storm, blizzard, lake effect snow warnings; freezing fog advisories (+1 to +15 hours with vertical slider) |

Some datasets such as NDFD, AIRMETs, radar, and NWS issued warnings are only available for the CONUS and US territories. AIRMETs are only available from the current time to between +6 and +12 hours. Where not available, NDFD is replaced with model derived data. Convective SIGMETs are only issued for the CONUS, however, SIGMETs for thunderstorms are available in non-CONUS locations.

Additional information is available in text format when mouse-clicking on the map or using the hover function. The “Map Options” menu enables the user to customize the display, including the base map selection, specific data displayed, and map opacity, scales, and density. Overlays include airports, heliports, runways, jet routes, airways, airspace, Air Route Traffic Control Center (ARTCC)/Flight Information Region (FIR) boundaries, Navigational Aids (NAVAIDs), aviation point fixes, highways, roads, counties, and rivers for the CONUS. More detail is also revealed as you zoom in and individual layers can be turned on or off independently.

In addition to the graphical display, static images are also available on Lambert-Conformal Conic projections. These images are issued daily every three hours, beginning at 00 UTC, and provide information on clouds, visibility, surface winds, precipitation, and weather as summarized in this table:

| Static Image | Weather Grid | Weather Overlay |
|--------------|--------------------|--|
| Clouds | RAP Cloud Coverage | Model derived Cloud Base, Layers, Tops |

| | | |
|---|-----------------|--|
| Visibility, Surface Winds, Precipitation, and Weather | LAMP visibility | NDFD or model derived Wind Speed & Gusts; NDFD or model derived Precipitation/Weather Type/Intensity |
|---|-----------------|--|

2. Purpose/Intended Use: Since the GFA provide equivalent meteorological information in-support of aviation, the National Weather Service, per request from the Federal Aviation Administration (FAA), ceased production of text CONUS Area Forecasts (FAs) on October 10, 2017. Transitioning to more-modern digital and graphical forecasts allows the AWC to focus the efforts of forecasters on maximizing operational benefit to aviation end users, resulting in improved weather information to decision-makers. The AWC continues to provide text Area Forecasts for the Gulf of Mexico, Caribbean, and portions of the Atlantic Ocean. The current GFA of these regions is intended to replace these text FAs. The experimental GFA now covers Hawaii and portions of the Pacific Ocean.

The FAA, pursuant to Title 49 United States Code Section 44720, established requirements for this weather information and service which is necessary for the safe and efficient conduct of operations in the National Airspace System (NAS).

3. Audience/Users: Commercial and general aviation pilots, operators, briefers, and dispatchers.

4. Presentation Format: The Experimental GFA contain multiple displays of weather phenomena combined in a single interactive online domain, with the additional option to view static imagery. Overlays include airports, heliports, runways, jet routes, airways, airspace, ARTCC/FIR boundaries, NAVAIDs, aviation point fixes, highways, roads, counties, and rivers for the CONUS, Gulf of Mexico, Caribbean, portions of the Atlantic Ocean, Hawaii, and portions of the Pacific Ocean.

5. Feedback Method/Period: Comments are requested on Experimental GFA and plans to discontinue production of the FA for Hawaii once the Experimental GFA product is approved as operational and when all concerns identified within submitted comments have been addressed. Comments/feedback will be accepted through December 31, 2019 via a public survey at:

<https://www.surveymonkey.com/r/ExpGFAExpansionPacific>

For more information, please contact:

Jonathan Leffler
Warning Coordination Meteorologist
Aviation Weather Center
Kansas City, MO 64153
816-584-7239
Jonathan.Leffler@noaa.gov

Part 2 – Technical Description

1. Format and Science Basis: The GFA combines OpenLayers displays of multiple weather parameters on a single webpage, with the additional option to view static imagery. The graphical display itself is not a weather product; it is a repository that aggregates a number of existing weather products into a single, quick-glance, automated display. Underlying products, except cloud and flight category data, have gone through a safety risk management process. These various graphics are overlaid on high-resolution base-maps and can be selected from the “Map Options” menu. The OpenLayers environment also offers more core functionality and support for mobile devices.

2. Training: A tutorial is available at <https://www.AviationWeather.gov/gfa/help?page=tutorial>

3. Availability: The Experimental Graphical Forecasts for Aviation over Hawaii and the Pacific Ocean is available at <https://testbed.AviationWeather.gov/gfa>

4. Additional Information: N/A.